WHAT IS CLAIMED IS:

1. A supporting base for gas separation membrane comprising a multilayer cylinder of porous sintered metal, wherein

the layer of the multilayer structure on the side in contact with the separated gas comprises a porous sintered metal having a relative density of at least 30% and being made of particles to be sintered having an average particle diameter of at least 10 μm;

the layer of the multilayer structure on the side of the gas separation membrane formation comprises a porous sintered metal made of particles to be sintered having an average particle diameter of 8 μm or less, and a maximum particle diameter of 45 μm or less and has a percentage of open area of at least 30%; and

said multilayer cylinder of porous sintered metal has an outer diameter of 15 mm or less, and a length of 100 mm or longer.

2. The supporting base for gas separation membrane according to claim 1 wherein said supporting base for gas separation membrane is the one produced by sintering particles having an aspect ratio of less than 2.

3. The supporting base for gas separation membrane according to claim 1 wherein a reaction barrier layer or a diffusion barrier layer is formed on the surface of the sintered metal on the side of the gas separation membrane formation.

4. The supporting base for gas separation membrane according to claim 1 wherein ###

5. A method for producing the supporting base for gas separation membrane of claim 1 comprising the steps of

continuously extruding raw metal powder materials corresponding to each constituent layer of said multilayer structure in the order starting from the raw metal powder material constituting the innermost layer to the raw metal powder material constituting the outermost layer such that the newly extruded layer surrounds the preceding layer to thereby produce a green cylinder of multilayer structure; and

sintering the green cylinder to produce the supporting base for gas separation membrane.

6. The method for producing a supporting base for gas separation membrane according to claim 5 wherein the raw metal powder materials corresponding to each constituent layer of said multilayer structure are extruded such that the layer extruded over the preceding layer is extruded at a pressure which is the same or lower than the pressure used in extruding the preceding layer.

7. A gas separation filter produced by forming a gas separation membrane on the supporting base for gas separation

membrane of claim 1 on the side of the gas separation membrane formation.

8. A gas separation filter according to claim 7 wherein said gas separation membrane is selected from a metal membrane, a zeolite membrane, a carbon membrane, an inorganic organic hybrid silica membrane, and an amorphous silica membrane.